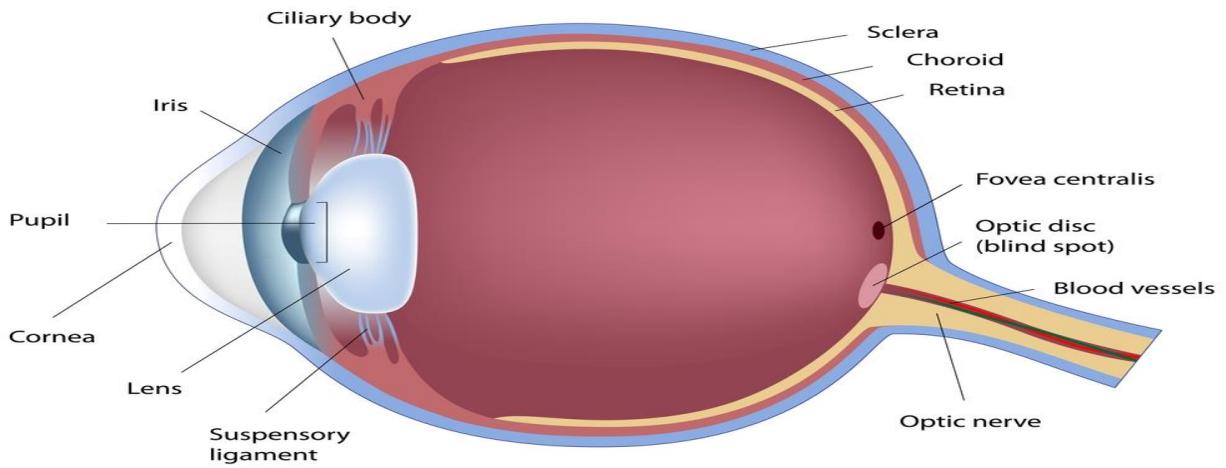


CCSLC-MODULE -4 -THE EYE

Human Eye Anatomy



A table showing the parts of the eye, a description and their function

Structure	Description	Function
Cornea	Translucent layer of tissue at front of eye	Bends light to bring it into focus on the retina
Iris	Coloured part of eye which is a ring of muscle.	Regulates the amount of light entering the eye
Pupil	Opening in the middle of the iris through which light enters	Regulates the amount of light entering the eye
Lens	Sac of fluid	Changes shape to allow images to be focused on the retina
Sclera	The tough, white coat of the eye	Protects the inner structures of the eye
Retina	The inner layer of the eye which contains light-sensitive cells	Changes light into electrical impulses to be forwarded to the brain
Optic nerve	A bundle of nerves fibers	Transmits electrical impulses from the eye to the brain
Aqueous humour	Clear fluid filling space between the cornea and the lens	Keeps the shape of eye
Vitreous humour	Viscous fluid which fills the space between the lens and the retina	Maintain pressure in the eye
Blind spot	Area of the retina where the retina meets the optic nerve. No rods or cons found here.	

Accommodation

Ability of the eye to change the shape of its lens to bring objects into focus on the retina

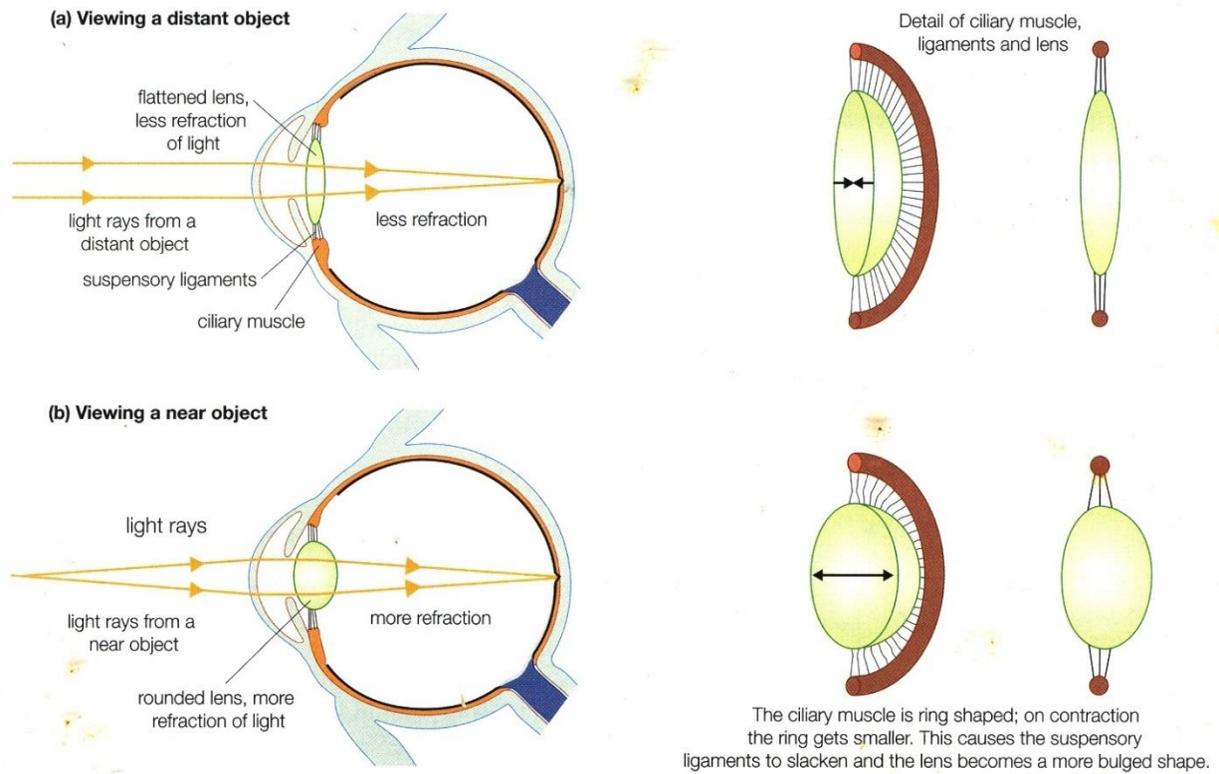
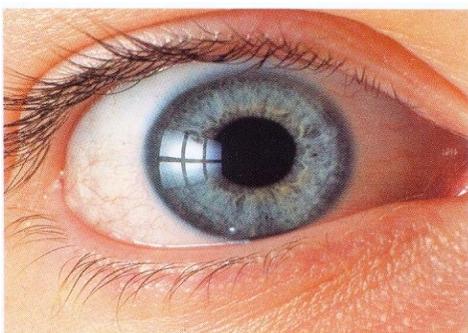


Figure 11.8 Accommodation: the way the lens adjusts to view near and distant objects.

Response of the eye to changing light intensity

The iris contains muscles which contract and relax to cause the pupil to become larger or smaller.

In bright light- the pupil gets smaller to reduce the amount of light entering the eye



In dim light- the pupil gets larger to allow more light to enter the eye



Vitamin A and eyesight

Vitamin A is needed for the maintenance of healthy cells in the eye and converting light into electrical signals to the retina

Sources of vitamin A - liver, butternut squash, carrots, papaya, mangoes, pumpkin, spinach

Common eye diseases

Complete the following tables

Common eye diseases	Effects of disease
Cataract	
Glaucoma	
Far-sightedness	
Short-sightedness	

Importance of protecting the eye

Your eye allows you to gather information about the environment which assists with keeping us safe.

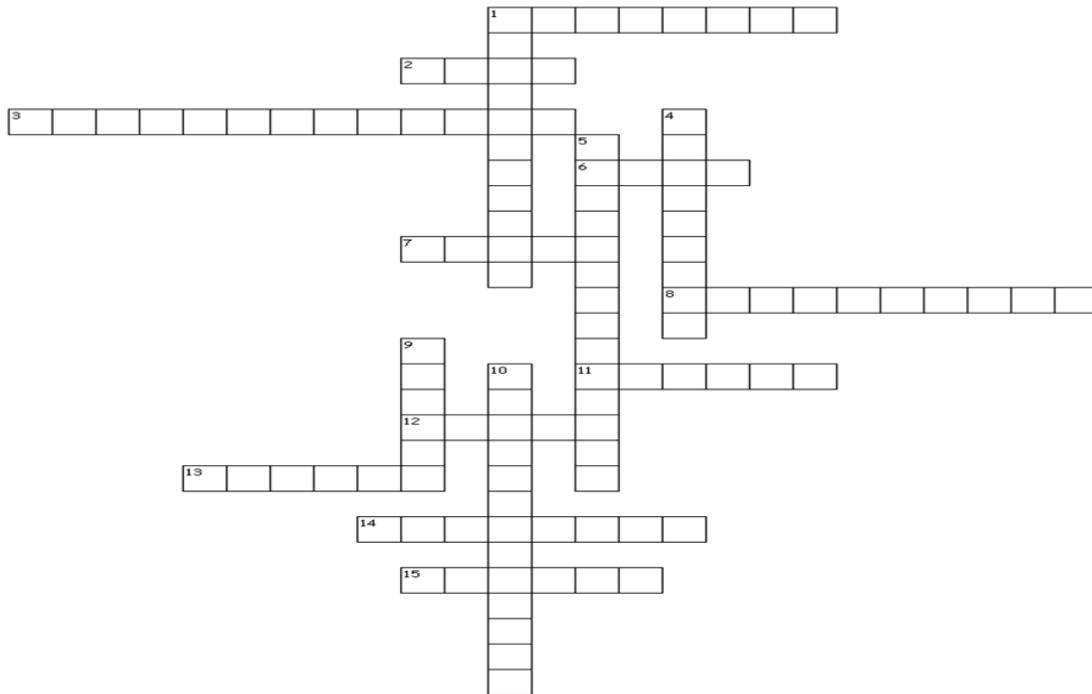
The eye should be protected from injury, we should

1. Reduce eyestrain. How should we reduce eye strain?

2. Wear sunglasses. Why should we wear sunglasses?

3. Wear goggles when engaged in sporting activities or around flying debris or corrosive chemicals

Complete the cross word of the eye



Across

- 1. lens becomes opaque with this disease
- 2. changes shape during accommodation
- 3. the liquid found at the front of the eye
- 6. the coloured area of the eye
- 7. most of the light entering the eye is focused here
- 8. sends electrical signals to the brain
- 11. eyeball is located here
- 12. controls the amount of light entering the eye
- 13. contains rods and cones
- 14. upside down
- 15. refracts the light that enters the eye

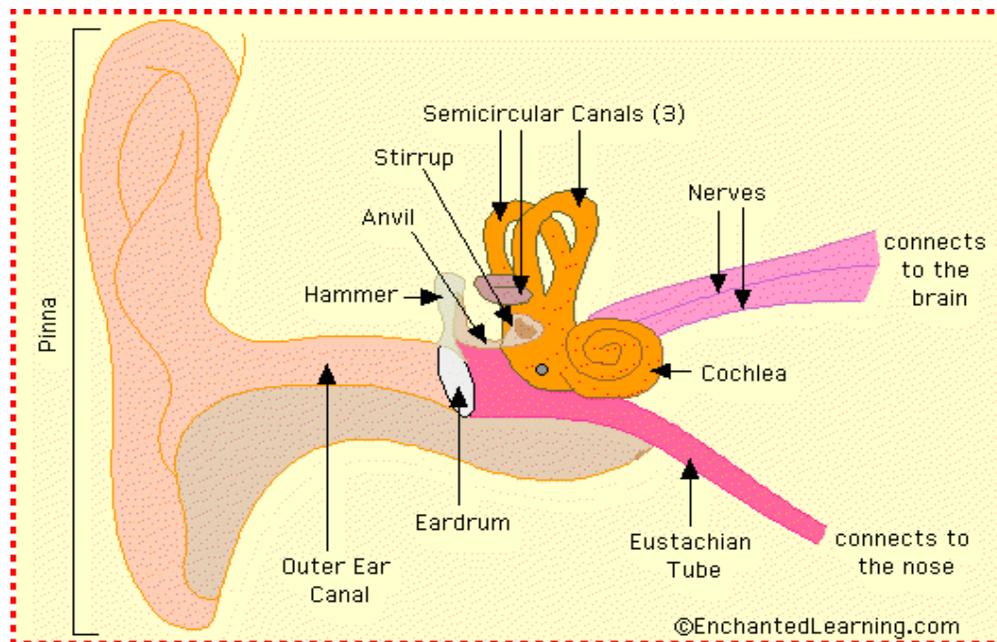
Down

- 1. protects the cornea
- 4. no rods and cones found here
- 5. contract and relax to help to focus light in the eye
- 9. another word for short sightedness
- 10. another word for long sightedness

CCSLC-MODULE 4-The Ear

(part source: <http://www.enchantedlearning.com/subjects/anatomy/ear/>)

Sound is collected by the pinna (the visible part of the ear) and directed through the outer ear canal. The sound makes the eardrum vibrate, which in turn causes a series of three tiny bones called the ossicles (the hammer, the anvil, and the stirrup) in the middle ear to vibrate. The vibration is transferred to the snail-shaped cochlea in the inner ear; the cochlea is lined with sensitive hairs which trigger the generation of nerve signals that are sent to the brain. On average, people can hear sounds in the frequencies between 20 to 20,000 Hertz.



****Read the definitions below, then label the ear anatomy diagram.****

anvil - (also called the incus) a tiny bone that passes vibrations from the hammer to the stirrup.

cochlea - a spiral-shaped, fluid-filled inner ear structure; it is lined with cilia (tiny hairs) that move when vibrated and cause a nerve impulse to form.

eardrum - (also called the tympanic membrane) a thin membrane that vibrates when sound waves reach it.

Eustachian tube - a tube that connects the middle ear to the back of the nose; it equalizes the pressure between the middle ear and the air outside. When you "pop" your ears as you change altitude (going up a mountain or in an airplane), you are equalizing the air pressure in your middle ear.

hammer - (also called the malleus) a tiny bone that passes vibrations from the eardrum to the anvil.

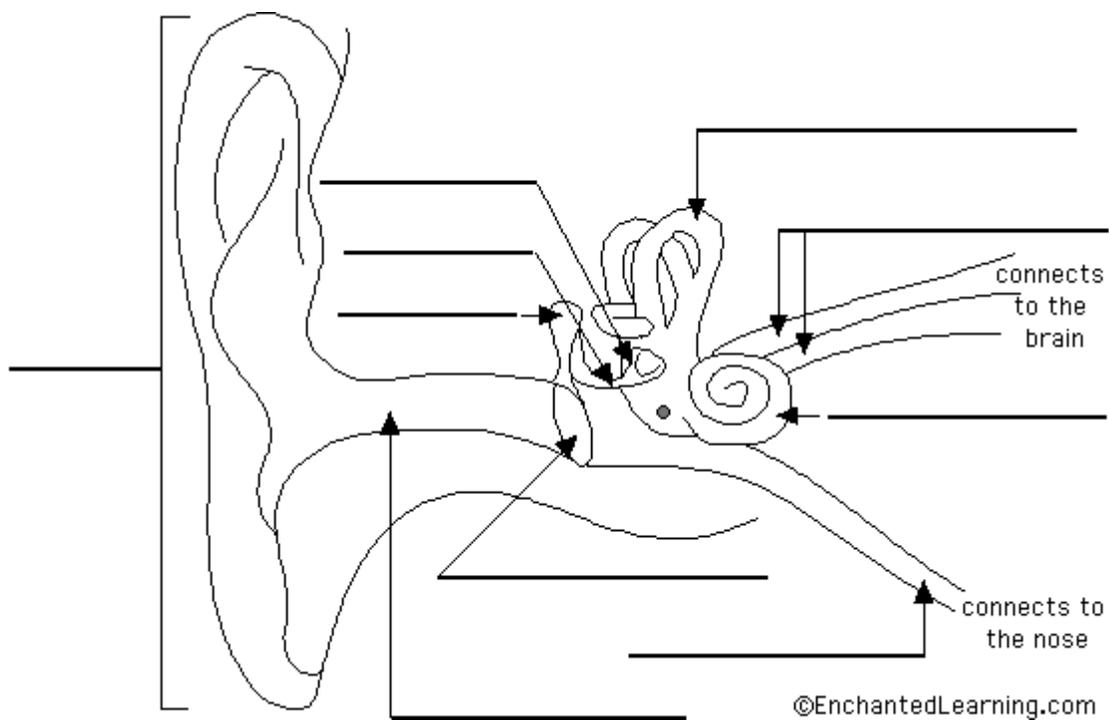
nerves - these carry electro-chemical signals from the inner ear (the cochlea) to the brain.

outer ear canal - the tube through which sound travels to the eardrum.

pinna - (also called the auricle) the visible part of the outer ear. It collects sound and directs it into the outer ear canal

semicircular canals - three loops of fluid-filled tubes that are attached to the cochlea in the inner ear. They help us maintain our sense of balance.

stirrup - (also called the stapes) a tiny, U-shaped bone that passes vibrations from the stirrup to the cochlea. This is the smallest bone in the human body (it is 0.25 to 0.33 cm long).



The ear detects sounds in our environment and allows us to make decisions which are intended to preserve our lives. Damage to any part of the ear may result in hearing loss or deafness.

In the space below, write FOUR ways in which the ears can be protected from injury.

- 1.
- 2.
- 3.
- 4.

The Tongue

(part source:

<http://www.enchantedlearning.com/subjects/anatomy/tongue/label/labeltongue.shtml>)

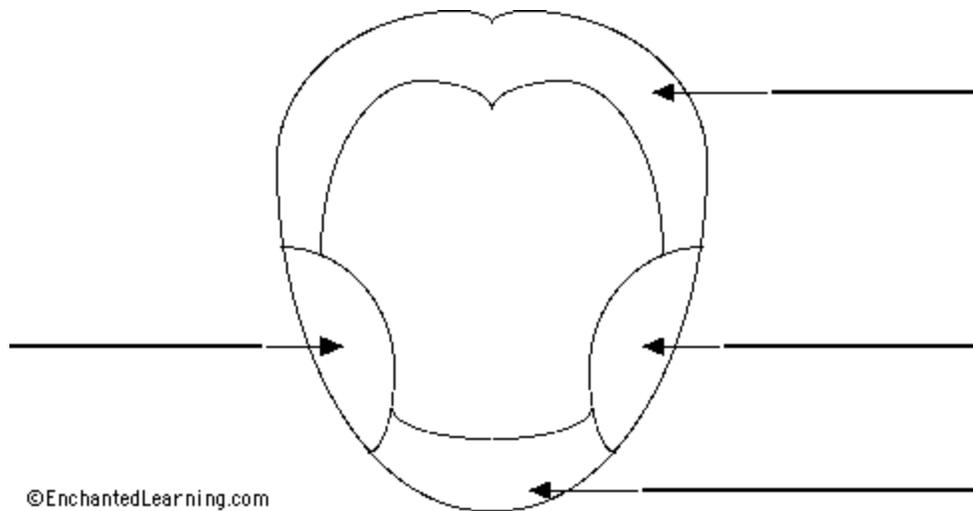
The tongue is a strong muscle in the mouth that is covered with papillae (small bumps on the tongue) and taste buds (that sense bitter, salty, sweet, and sour tastes). The taste buds are clustered along the sides of the tongue.

****Read the descriptions, then label the tongue below.****

bitter - Bitter tastes (like the taste of tonic water) are mostly sensed towards the back and rear sides of the tongue.

salty and sweet - Salty tastes and sweet tastes (like sugar) are mostly tasted at the tip of the tongue.

sour - Sour tastes (like lemon juice) are mostly tasted at the sides of the tongue, at the middle and towards the front.



In the space below, name TWO OR MORE foods which have the following tastes.

Bitter:

Sweet:

Sour:

Salty:

How do we smell?

Smells and odours are detected when sensory cells in the nostrils are stimulated by particles of smells in the air which enter the nose. Being able to smell is important because it allows us to detect odours that are offensive, poisonous and corrosive. How something tastes is closely related to how it smells.

Think time! - Can you explain why it is difficult to taste our food when we have a cold?

Check the following websites for more information on the sense of smell:

<https://www.intelihealth.com/article/how-does-our-sense-of-smell-work>

<https://www.youtube.com/watch?v=snJnO6OpjCs>

CCSLC Module 4: NUTRITION

1. Important Definitions

Nutrition – food consumed by organisms to provide the substances needed to sustain life,

Food – any substance consumed to provide nutrients and energy.

Nutrient – a chemical needed by an organism to sustain life and growth; found in food.

Malnutrition – unbalanced diet; nutrients lacking, in surplus or in incorrect proportions.

Junk Food/Empty Calories – food with large amounts of calories but little nutritional value.

Meal – the food(s) consumed at a particular time of the day.

Balanced Diet – consuming all of the nutrients in the correct proportions.

Snack – a small portion of food eaten between regular meals

2. Table 1: Caribbean food groups, the major nutrients in each food group and examples of the foods that contain these nutrients.

Food Group	Major Nutrient(s)	Two Food Examples
Staples	Carbohydrates	Cereals (bread), root crops (sweet and English potato, cassava etc) and starchy fruits
Food from animals	Protein	Meat, fish, milk and cheese
Fats and Oils	Lipids	Butter, Avocado, Milk and Margarine
Vegetables	Minerals, Vitamins & Water	Tomatoes, Cabbage, String Beans, Spinach, Cucumber, etc
Fruits	Minerals, Vitamins & Water	Oranges, Mangoes, Guavas, Peaches, Water Melon etc
Legumes & Nuts	Protein	Beans, Peas & Nuts

3. Table 2: Diseases that result from the deficiency of nutrients

A deficiency disease is any disease caused by a lack of an essential nutrient. Deficiency diseases result from malnutrition.

Major Nutrient(s)	Disease/Deficiency
Carbohydrates	Hypoglycemia
Protein	Kwashiorkor, Marasmus
Lipids	Eczema, soft nails
Vitamins A	Night Blindness
Vitamins B	Weakness, numbness & Shortness of Breath
Vitamin C	Scurvy
Vitamin D	Rickets
Iron	Anemia

Iodine	Goitre
Water	Dehydration, Constipation, Elevated body temperature etc.

4. Table 3: Elements present in Macronutrients

Major Nutrient(s)	Elements
Carbohydrates	C, H, & O
Protein	C, H, & O
Lipids	C, H, O, N, & S

Key: C – Carbon, H – Hydrogen, O – Oxygen, N – Nitrogen, S– Sulphur

Preparing a Menu

Menu planning is the process of choosing dishes for a specified event or individual.

Types of Menus

- ◆ Breakfast- (offers fruits, juices, eggs, cereals, pancakes, waffles)
- ◆ Lunch - (features sandwiches, soups & salads; usually lighter than dinner menu items)
- ◆ Dinner - (more elaborate, steaks, roasts, chicken, sea food and pasta; wines, cocktails, etc..)

Example of a menu



Assignments

1. Write a description of each disease/deficiency, mentioned in Table 2.
2. Prepare a balance meal using pictures or models of actual food to be displayed on your plate using the Caribbean food groups.
3. Design and plan a menu for a special occasion or individual using Caribbean food groups.

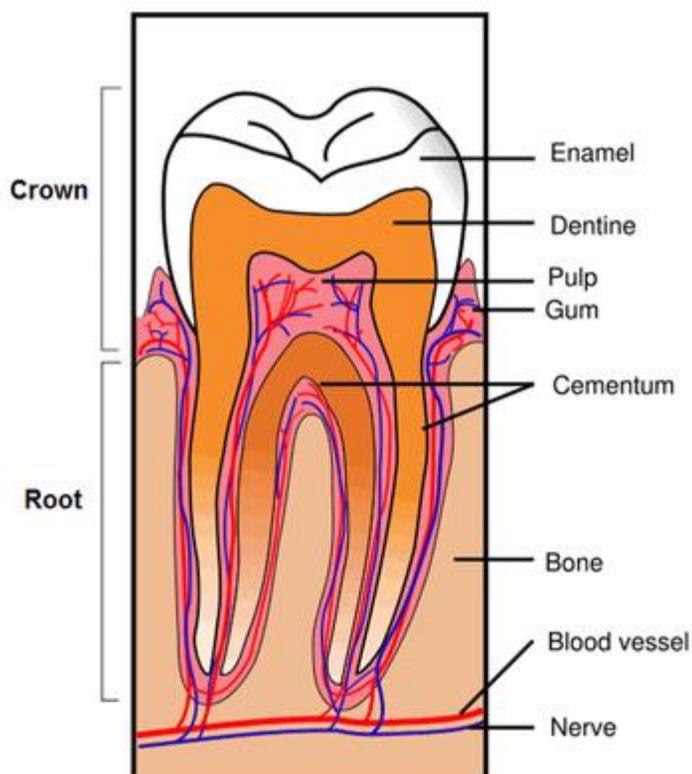
CCSLC-DIGESTION & TEETH

Introduction

Humans and animals have many different types of teeth. The teeth are designed for cutting and grinding food into smaller pieces (Mastication). This is mechanical breakdown of food.

Our teeth also will change with age. So, the teeth you have when you are a baby aren't the same as the one's you will have as an adult. Bacteria can ruin teeth and stop them from doing their job.

Parts of the Tooth



What Are the Different Parts of a Tooth?

- **Crown** — the top part of the tooth, and the only part you can normally see. The shape of the crown determines the tooth's function. For example, front teeth are sharp and chisel-shaped for cutting, while molars have flat surfaces for grinding.
- **Gumline** — where the tooth and the gums meet. Without proper brushing and flossing, plaque and tartar can build up at the gumline, leading to gingivitis and gum disease.
- **Root** — the part of the tooth that is embedded in bone. The root makes up about two-thirds of the tooth and holds the tooth in place.
- **Enamel** — the outermost layer of the tooth. Enamel is the hardest, most mineralized tissue in the body — yet it can be damaged by decay if teeth are not cared for properly.
- **Dentin** — the layer of the tooth under the enamel. If decay is able to progress its way through the enamel, it next attacks the dentin — where millions of tiny tubes lead directly to the dental pulp.
- **Pulp** — the soft tissue found in the center of all teeth, where the nerve tissue and blood vessels are. If tooth decay reaches the pulp, you usually feel pain.

Types of human teeth

	Incisor	Canine	Premolar	Molar
				
Position in mouth	Front	Either side of incisors	Behind canine	Back
Description	Chisel-shaped (sharp edge)	Slightly more pointed than incisors	2 points (cusps), 1 or 2 roots	4 or 5 cusps 2 or 3 roots
Function	Biting of pieces of food	Similar function to incisors	Tearing and grinding food	Chewing and grinding food

Humans have three main types of teeth:

- **a.** Canines - used for tearing and ripping food.
- **b.** Incisors - help you bite off and chew pieces of food.
- **c.** Molars and pre-molars - help you crush and grind food

How our teeth develop

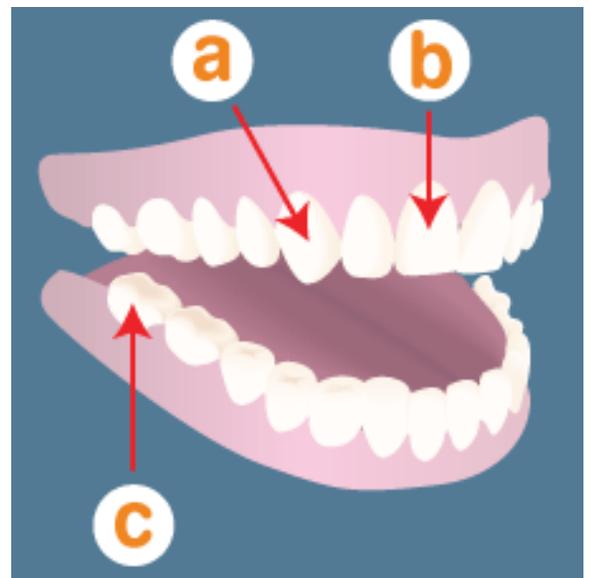
Humans have two sets of teeth in their life:

1. Milk (baby) teeth

These are the first set of teeth to grow. They start growing between six and ten months of age. A child will have around 20 baby teeth by the time he or she is three years old. 8 incisors, 4 canines, 8 premolars.

2. Permanent (adult) teeth

Baby teeth should begin to fall out by the age of six, leaving space for adult teeth to grow. An adult can grow up to 32 permanent teeth. 12 more teeth than an infant. All of which are molars.



Looking after our teeth

Sugar left in the mouth is eaten by bacteria. The bacteria make **acid** that rots teeth and cause tooth decay (cavities). Taking care of our teeth prevents tooth decay. You can take care of your teeth by:

- brushing twice a day/regularly
- flossing regularly
- snacking on hard crispy foods like apples
- eating the right foods (not too many sugary ones)
- visiting the dentist regularly

MODULE 4- Digestion in man

Introduction

Function: the mechanical and chemical breakdown of foods and the absorption of nutrients by cells.

It consists of: alimentary canal (9 m from mouth to anus) and accessory organs.

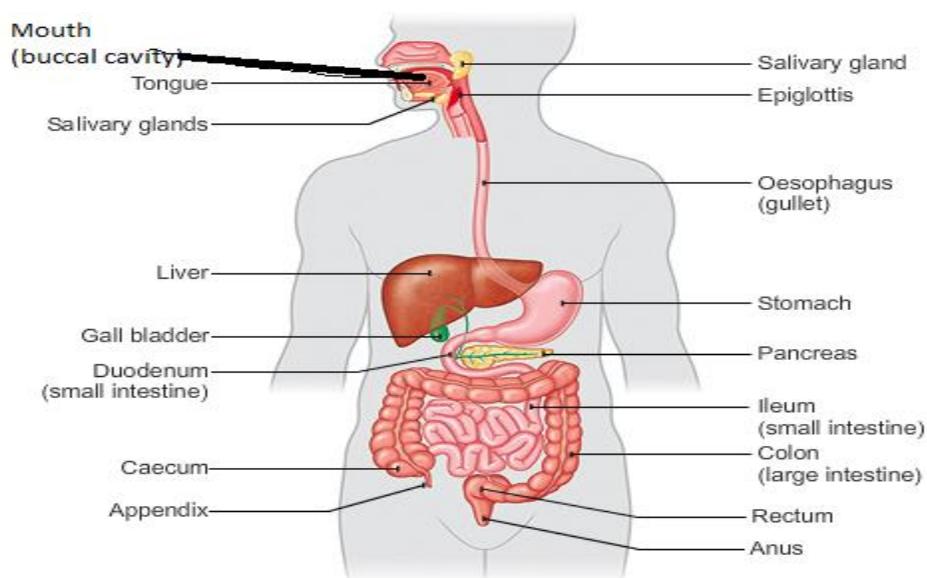
Physical/mechanical digestion

- This Involves the crush and churning of food and this takes place in the mouth by teeth and in the stomach by the movement of the stomach walls

Chemical digestion

- This is the chemical break down of food and the involve biological catalyst called enzymes.

General Characteristics of the Alimentary Canal



The alimentary canal is made up of the

- Oral/buccal cavity (mouth),
- pharynx,
- oesophagus,

- stomach,
- small intestines,
- and large intestines.

In addition to the alimentary canal, there are several important accessory organs that help your body to digest food but do not have food pass through them. Accessory organs of the digestive system include the

- teeth,
- tongue,
- salivary glands,
- liver,
- gallbladder,
- and pancreas.

To achieve the goal of providing energy and nutrients to the body, six major functions take place in the digestive system:

- Ingestion of food
- Secretion of fluids and digestive enzymes
- Mixing and movement of food and wastes through the body
- Digestion of food into smaller pieces
- Absorption of nutrients
- Egestion of wastes

Ingestion

The first function of the digestive system is ingestion, or the intake of food. The mouth is responsible for this function.

Secretion

In the course of a day, the digestive system secretes around 7 liters of fluids. These fluids include saliva,

- mucus,
- hydrochloric acid,
- enzymes,
- and bile.

Saliva moistens dry food and contains salivary amylase, a digestive enzyme that begins the digestion of carbohydrates.

Mucus serves as a protective barrier and lubricant inside of the GI tract.

Hydrochloric acid helps to digest food chemically and protects the body by killing bacteria present in our food.

Enzymes are like tiny biochemical machines that disassemble large macromolecules like

- proteins into **amino acids**
- carbohydrates such as starch and sugar are broken into **glucose**
- and lipids into **fatty acids and glycerol**

Finally, bile is used to emulsify (to mix liquids together to form an emulsion.e.g. milk and butter are emulsions.) large masses of lipids into tiny globules for easy digestion.

Mixing and Movement

The digestive system uses 2 main processes to move and mix food:

Swallowing. Swallowing is the process of using smooth and skeletal muscles in the mouth, tongue, and pharynx to push food out of the mouth, through the pharynx, and into the esophagus.

Peristalsis. Peristalsis is a muscular wave that travels the length of the GI tract, moving partially digested food a short distance down the tract. It takes many waves of peristalsis for food to travel from the esophagus, through the stomach and intestines, and reach the end of the GI tract.

Digestion- Digestion is the process of turning large pieces of food into its component chemicals.

Mechanical digestion is the physical breakdown of large pieces of food into smaller pieces. This mode of digestion begins with the chewing of food by the teeth and is continued through the muscular mixing of food by the stomach and intestines. Bile produced by the liver is also used to mechanically break fats into smaller globules. While food is being mechanically digested it is also being chemically digested as larger and more complex molecules are being broken down into smaller molecules that are easier to absorb.

Chemical digestion begins in the mouth with salivary amylase in saliva splitting complex carbohydrates into simple carbohydrates. The enzymes and acid in the stomach continue chemical digestion, but the bulk of chemical digestion takes place in the small intestine thanks to the action of the pancreas. The pancreas secretes an incredibly strong digestive cocktail known as pancreatic juice, which is capable of digesting lipids, carbohydrates, proteins and nucleic acids. By the time food has left the duodenum, it has been reduced to its chemical building blocks—fatty acids, amino acids, monosaccharides, and nucleotides.

Absorption

Once food has been reduced to its building blocks, it is ready for the body to absorb. Absorption begins in the stomach with simple molecules like water and alcohol being absorbed directly into the bloodstream.

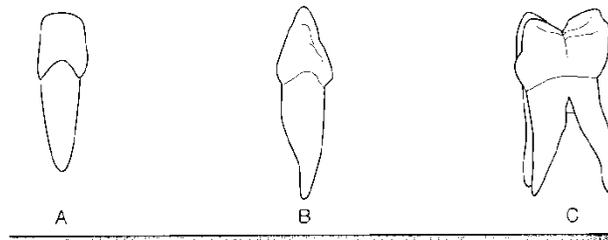
Most absorption takes place in the walls of the small intestine, which are densely folded to maximize the surface area in contact with digested food. The large intestine is also involved in the absorption of water and vitamins B and K before faeces leave the body.

Egestion

The final function of the digestive system is the elimination of waste in a process known as defecation. Defecation removes indigestible substances from the body so that they do not accumulate inside the gut. The timing of defecation is controlled voluntarily by the conscious part of the brain, but must be accomplished on a regular basis to prevent a backup of indigestible materials (constipation).

WORKSHEET

1. i) Label the different types of human teeth shown below:



A _____ B _____ C _____

- ii) State the importance of each type of teeth in digestion:

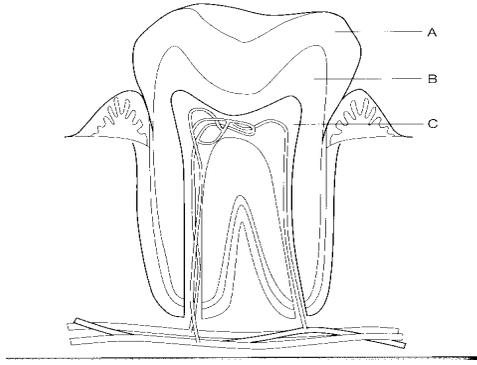
A _____

B _____

C _____

3 marks

iii) Label the internal structure of the tooth shown below:



A _____ B _____ C _____ 3 marks

2. The figure below represents the human digestive tract in which food is digested as it passes through.

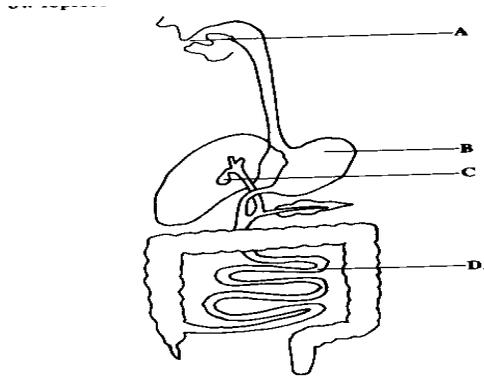


Figure IV

a) i) Name EACH of the structures labeled A to D.

A _____

B _____

C _____

D _____ 4 marks

ii) In which of the labeled structures is hydrochloric acid produced?

1 mark

b) Excess hydrochloric acid in the digestive system sometimes results in a burning pain.

What kind of substance would neutralize the acid and thus stop the pain?

2 marks

c) What is the function of the structure labeled C?

1 mark

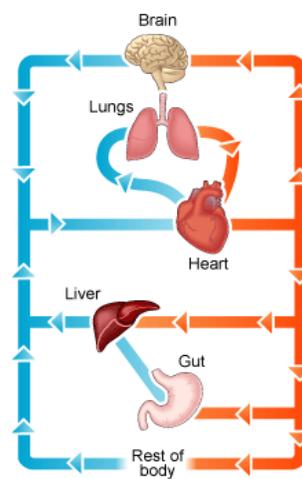
MODULE 4-THE CIRCULATORY SYSTEM

This is a group of organs which promotes the transporting of blood throughout the body.

The circulatory system is made up of three parts:-

- The heart, which is the pump;
- Blood which is the fluid being pumped and contains all the materials to be pumped around the body;
- The blood vessels, or 'pipes', through which blood flow to get to and from the cells – these are the arteries, veins and capillaries.

Flowchart of the circulatory system



■ Deoxygenated blood

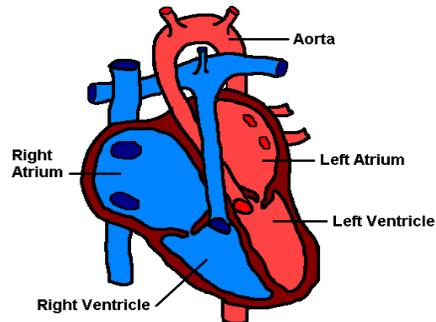
■ Oxygenated blood

⇒ Direction of blood flow

Parts of the circulatory system:-

- Heart

The heart is a muscular organ that pumps the blood around the body. It is roughly the size of one's fist and is made up of four chambers.



- Blood

This is a red fluid which supplies nutrients and oxygen to various cells of the body and takes waste products away from them.

Deoxygenated blood – Blood which does not contain oxygen

Oxygenated blood – Blood which contains oxygen

- Arteries

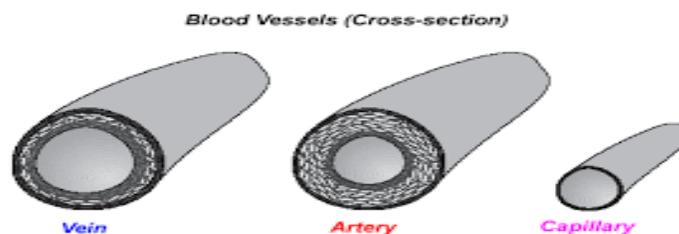
These transport blood away from the heart. The walls of the arteries tend to be muscular and thick with small lumens. This is so because the blood in the arteries is under high pressure generated from the heart.

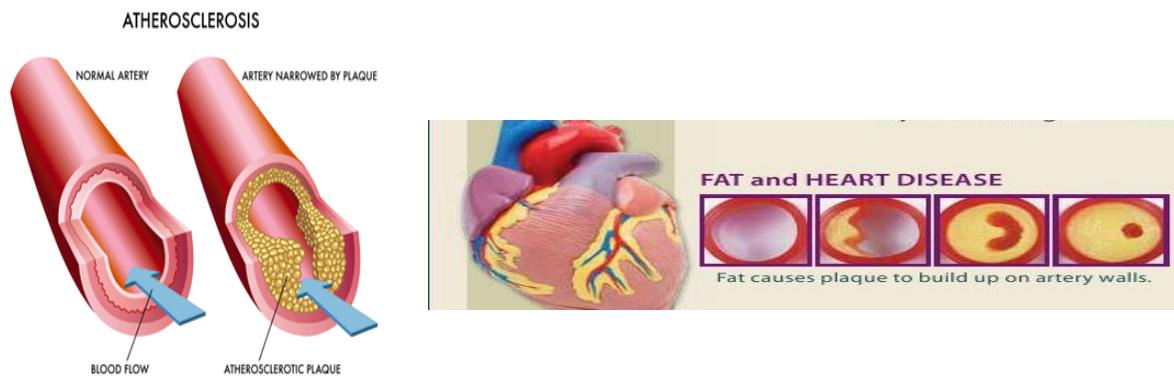
- Veins

These transport blood to the heart. The walls of the veins tend to be muscular and thin with large lumens. This is so because the blood in the veins is under lower pressure than the blood in the arteries.

- Capillaries

These allow food and oxygen to diffuse to cells and waste to diffuse from cells. They are not muscular but the lumen is large.





Discuss the above diagrams.

MODULE 4-Health and Well-being

Personal hygiene is the act of cleansing and grooming the external body to prevent contracting and spreading of diseases. It also allows one to be accepted socially.

TIPS

1. TAKE REGULAR BATHS



- Gets rid of body odors that aren't deemed to be pleasant
- Removes dirt, oils and bacteria that are present on the skin

2. BRUSH & FLOSS TEETH (ALSO VISIT THE DENTIST REGULARLY)

- This promotes brighter and whiter teeth along with fresher breath
- This lowers the risk of gum disease, loss of teeth, dental problems, plaque and tartar build up and staining of the teeth.



3. WEAR CLEAN CLOTHES

- When clothes become stained and dirty, bacteria start to work on these stains and make clothing smell.
- Wear dirty, filthy clothes can cause ailments and sicknesses and can spread diseases.

4. WASH HAIR REGULARLY

- This removes dirt and oil which can cause acne and pimples to occur on the face.

Kitchen Hygiene

Kitchen hygiene is the act of keeping the kitchen in a clean and sanitary state to prevent bacteria, infections and diseases from spreading. It also prevent food contamination.

TIPS



1. COVER HAIR WHEN DEALING WITH FOOD
2. CLEAN WORKING SURFACES BEFORE AND AFTER COOKING
3. CLEAN ALL NAILS (REMOVE ALL DIRT FROM UNDER NAILS AND PAINTED NAIL POLISH)

MODULE 4- MAINTAINING HEALTHY LIFESTYLES

To maintain a healthy lifestyle one should:-

- i) Have adequate exercise
- ii) Have proper personal hygiene
- iii) Consume balanced meals
- iv) Have adequate hours of rest



"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

